A VASCULAR FLORA SURVEY OF EMERGENT CREEK BED MICROHABITATS OF KISATCHIE BAYOU TRIBUTARIES IN NATCHITOCHES PARISH, LOUISIANA

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ABSTRACT

Tributaries flowing into Kisatchie Bayou in southwestern Natchitoches Parish, Louisiana are characterized by clear flowing water and white sand bottoms. In places, sandstone or siltstone creek beds emerge during normal water levels but quickly become inundated during periods of rain. These emergent creek beds provide a unique microhabitat that hosts a distinctive flora. A total of 70 species representing 30 families and 52 genera were discovered in this base-line vascular plant survey of these emergent creek beds. With few exceptions, the plant species here appear to be well-adapted for life in this challenging microhabitat.

KEY WORDS: Kisatchie Bayou, plant microhabitat, vascular flora survey

RESUMEN

Los afluentes que discurren por Kisatchie Bayou en el sudoeste de Natchitoches Parish, Luisiana se caracterizan por el agua clara que fluye y los fondos de arena blanca. En algunos lugares, los bancos de arenisca o aluviones emergen con niveles de agua normales pero se inundan rápidamente durante los períodos de lluvia. Estos bancos inesperados proporcionan un microhábitat único que alberga una flora distinta. Un total de 70 especies que representan a 30 familias y 52 géneros se descubrieron en un muestreo de la flora vascular de estos bancos inesperados, con pocas excepciones, estas especies parecen estar bien adaptadas para la vida en este microhábitat desafiante.

Tributaries flowing into Kisatchie Bayou in southwestern Natchitoches Parish, Louisiana are characterized by clear flowing water and white sand bottoms. In places, sandstone or siltstone creek beds emerge during normal water levels. Their surfaces are devoid of sand and soil except in small crevices and fissures. The emergent creek beds remain perpetually damp because water permeates these fissures.

The physiographic expression of the sector where Kisatchie Bayou and its tributaries reside reflects the lithologies of the Miocene Epoch (Andersen 1993). Andersen (1993) designates the physiography of the creeks draining the area as recent alluvium (undifferentiated) of the Holocene.

Martin et al. (1990) designated the soil along the stream banks, which ultimately washes into these tributaries as "Kisatchie-Oula." This soil type is broadly

defined as a very strongly acidic fine sandy loam occurring on 5–40% slopes. Additionally, this soil is low in fertility and runoff is rapid (Martin Jr. et al. 1990).

Some emergent creek beds are inhabited by a small number of vascular plants, bryophytes (mosses and liverworts) and lichens. Plants are rooted in the crevices and fissures. However, lichens are directly attached to the rock substrate. Only those plants that manage to remain rooted during periods of inundation survive in this unique and challenging microhabitat.

The purpose of this study is to survey the vascular flora of the emergent creek beds of Kisatchie Bayou tributaries. This survey provides a base-line inventory of this distinctive plant community that can be used for comparison to monitor changes that may occur due to natural or human perturbance.

METHODS

Several tributaries to Kisatchie Bayou were located by examining Natchitoches Parish aerial soil survey maps (Martin Jr. et al. 1990). Study sites were discovered by exploring these tributaries on foot.

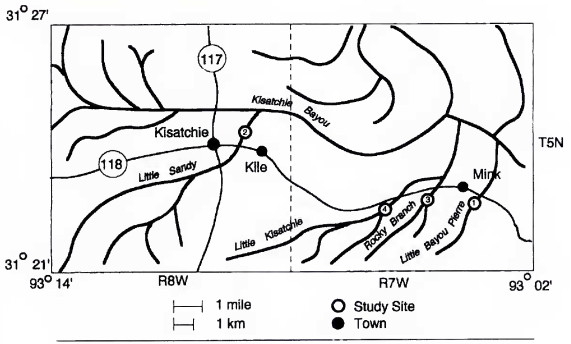
Each study site was surveyed periodically throughout the entire year of 2002. At least one voucher specimen was collected for each species; voucher numbers are indicated in Table 1. All vouchers are housed at McNeese State University Herbarium (MCN). Nomenclature follows Kartesz (1999) with the exception of *Aletris lutea* (Narthecicaceae), where nomenclature follows Angiosperm Phylogeny Group (1998).

RESULTS

Vascular plants are not present in all emergent creek beds. However, they typically occur in areas where the creeks are broadened and the water levels are comparatively low. Additionally, these areas are often associated with small waterfalls and rippled currents. The forest canopy is more open in these broadened areas with consequent increased light levels. A detailed description of each study site follows. The location of each site is indicated in Figure 1.

Site 1 occurs in *Little Bayou Pierre*. This area is characterized by sandstone islets and peninsulas that lie just above the normal water level. Small waterfalls are present. The site is about 85 m long and about 18m at its widest point. The site is just south of the bridge along Hwy. 118 near Mink, 31° 23' 38" north and 93° 03' 52" west.

Site 2 occurs in *Little Sandy*. This area is characterized by islets and a few small peninsulas. The substrate here appears to be siltstone which is softer and darker than the sandstone found in the three other study sites. There are no waterfalls here; however, the creek bed topology produces turbulence and rippling. The area is about 73 m long and about 19m at its widest point. The site is about 1 km north of the bridge on Hwy. 118 and about 2.5 km east of the town of Kisatchie, 31° 24' 37" north and 93° 09' 7" west.



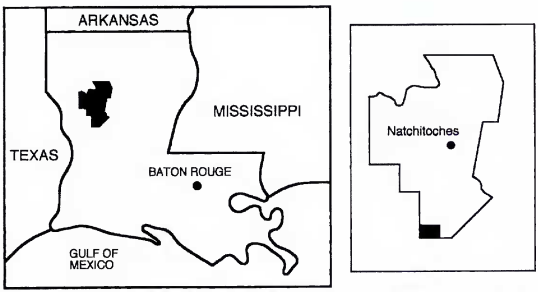


FIG. 1. Detailed map of the emergent creek bed study sites is depicted in the upper illustration; Louisiana State Highways 117 and 118 are indicated. The lower right illustration shows the study area in relation to Natchitoches Parish. The position of Natchitoches Parish within Louisiana is indicated in the lower left illustration.

Site 3 occurs in *Rocky Branch*. This area is characterized by a mixture of islets and peninsulas. A small waterfall is present. The area is about 38 m long and about 14 m at its widest point. The site is about 100 m south of the bridge on Hwy. 118 and about 3.6 km east of the town of Kisatchie, 31° 23' 50" north and 93° 05' 40" west.

Site 4 occurs in *Little Kisatchie Bayou*. The area is characterized by a mixture of peninsulas and islets. Rippled water flow occurs here but no waterfall is present. The area is about 49m long and about 9m at its widest point. The site is about 100 meters south of the bridge on Hwy. 118 about 3km east of the town of Kisatchie, 31° 23' 49" north and 93° 06' 29" west.

A total of 70 vascular plant species representing 30 families and 52 genera were discovered in this survey (Table 1). Of these, 32 species were found in two or more study sites. With a total of 57 species discovered, study site 1 was the most diverse. In study sites 2, 3 and 4, a total of 23, 20 and 21 species were discovered, respectively (Table 1).

DISCUSSION

Emergent creek beds within the Kisatchie Bayou tributaries provide a distinctive plant microhabitat. Observations made during this study suggest that this flora is stable. Periods of submergence had little impact on the overall health of the flora. For example, the effects of heavy rainfall from the remnants of hurricanes Lili and Kenna in October 2002 were minimal. Although larger plants were lodged by the strong force of rapidly moving water, they appeared to suffer no irreparable damage and recovered rapidly.

Although most species appeared to be thriving on the emergent creek beds, there were two notable exceptions. Of the several individuals of *Pinus taeda* that were discovered, all were seedlings or juveniles. It appears that the small fissures in which they were rooted had insufficient soil or space for plants to reach maturity. The one individual of *Baccharis halimifolia* appeared to have been repeatedly damaged by high water. Although individuals of these two species had managed to germinate and survive for a time, they do not appear to be adapted well for survival on the emergent creek beds.

Additionally, observations made during this study suggest that this flora is fertile. Specifically, all discovered species, with the exception of *Pinus taeda* and *Baccharis halimifolia*, produced spores or seeds during 2002.

ACKNOWLEDGMENTS

We thank Mark Paulissen for his review of an earlier version of this paper and the Kisatchie District of the U.S. Forestry Service.

TABLE 1. Species found listed by family and division with voucher numbers indicated. Presence of a species at each study site is indicated by an "X." Specimens curated at McMeese State University (MCN).

Taxon	Study Site 1	2	3	4	Voucher
DIVISION LYCOPODIOPHYTA					
Lycopodiaceae					
Lycopodiella appressa (Chapm.) Cranfill	X				1964
DIVISION FILICOPHYTA					
Dryopteridaceae					
Onoclea sensibilis L.	X	X			1987
Lygodiaceae					
Lygodium japonicum (Thunb.) Sw.	X				1996
Osmundaceae					
Osmunda regalis L. var. *spectabilis* (Willd.) A. Gray	X		X		1997
DIVISION CONIFEROPHYTA					
Pinaceae					
Pinus taeda L.	X		X		1968
DIVISION MAGNOLIOPHYTA					
CLASS MAGNOLIOPSIDA (DICOTS)					
Apiaceae					
Eryngium integrifolium Walt.	X	X		X	2035
Ptilimnium capillaceum (Michx.) Raf.	X			X	1993
Asteraceae					
Baccharis halimifolia L.		X			2060
Coreopsis linifolia Nutt.	X				2053
Coreopsis tripteris L.	X			X	2038
Elephantopus carolinianus Raeusch	X	X	X		1988
Helianthus hirsutus Raf.	X			X	2055
Pityopsis graminifolia (Michx.) Nutt.	X				2057
Pluchea camphorata (L.) DC.	X	X	X		2063
Solidago rugosa P. Mill.	X	X	X	X	2041
Symphyotrichum lateriflorum (L.) A. & D. Löve	X	X		X	2065
Betulaceae					
Alnus serrulata (Ait.) Willd.	X	X	X	X	1787
Buddlejaceae					
Polypremum procumbens L.		X			
Campanulaceae					
Lobelia puberula Michx. var. *pauciflora* Bush	X			X	2054
Clusiaceae					
Hypericum mutilum L.	X	X	X	X	1973
Hypericum brachyphyllum (Spach.) Steud.	X	X	X		2019
Droseraceae					
Drosera brevifolia Pursh	X				1998

TABLE 1. continued

Taxon	Study Site 1	2	3	4	Voucher
Ericaceae					
Rhododendron canescens (Michx.) Sweet	X			X	1999
Vaccinium elliottii Chapm.	X			X	1994
Fabaceae					
Desmodium lineatum DC.	X				2057
Desmodium paniculatum (L.) DC.	X		X		2058
Lespedeza virginica (L.) Britt.			X		2045
Lamiaceae					
Lycopus virginicus L.	X	X	X	X	2039
Scutellaria integrifolia L.	X			X	2007
Lentibulariaceae					
Pinguicula pumila Michx.	X				2000
Utricularia cornuta Michx.	X				1956
Utricularia juncea Vahl	X				1955
Loganiaceae					
Mitreola sessilifolia (J.F. Gmel.) G. Don	X				2023
Lythraceae					
Didiplis diandra (DC.) Wood.		X			2028
Melastomataceae					
Rhexia virginica L.	X				1965
Myricaceae					
Myrica cerifera L.	X			X	2001
Narthicaceae					
Aletris lutea Small	X				2002
Onagraceae					
Ludwigia alternifolia L.	X	X	X		2016
Rubiaceae					
Mitchella repens L.	X		X		2003
Scrophulariaceae					
Mecardonia procumbens (P. Mill.) Small		X			1990
Gratiola pilosa Michx.	X	X			2005
Violaceae					
Viola _ primulifolia L. (pro. sp.)	X		X	X	2059
CLASS LILIOPSIDA (MONOCOTS)					
Burmanniaceae					
Burmannia capitata (Walt.) Mart.	X				958
Cyperaceae					
Carex amphibola Steud.	X				1960
Carex tribuloides Wahlenb.	X				2026
Cyperus haspan L.	X	X			2011
Eleocharis microcarpa Torr.	X				2015
Fimbristylis autumnalis (L.) Roem. & Schult.		X			2044
Fuirena simplex Vahl		X			2043
Fuirena squarrosa Michx.	X				2025

TABLE 1. continued

Taxon	Study Site 1	2	3	4	Voucher
Rhynchospora corniculata (Lam.) A. Gray		X			1985
Rhynchospora glomerata (L.) Vahl			X	X	2017
Rhynchospora inexpansa (Michx.) Vahl			X		2018
Juncaceae					
Juncus coriaceus Mackenzie	X	X		X	1961
Juncus nodatus Coville		X			2027
Juncus scirpoides Lam.	X				1959
Juncus tenuis Willd.		X			2020
Poaceae					
Chasmanthium laxum (L.) Yates	X		X		2030
Dichanthelium dichotomum (L.) Gould var. *ensifolium* (Baldw. ex Ell.) Gould & C. A. Clark	X	X	X	X	1958
Dichanthelium sphaerocarpon (Ell.) Gould var. *isophyllum* (Scribn.) Gould & C. A. Clark	X		X	X	1957
Dichanthelium scoparium (Lam.) Gould	X				2010
Panicum virgatum L.				X	2042
Paspalum setaceum Michx.	X				2032
Paspalum urvillei Steud.	X				2009
Steinchisma hians (Ell.) Nash	X				2008
Xyridaceae					
Xyris ambigua Bey. ex Kunth	X				2031
Xyris baldwiniana Schult.	X				1962
Xyris difformis Chapm. var. *curtisii* (Malme) Kral	X				1967
Xyris laxifolia Mart. var. *iridifolia* (Chapm.) Kral	X			X	1963
Xyris torta Sm. in Rees	X				2006

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